HOME ASSIGNMENT (2023 batch)

Bachelor of Computer Application (BCA) NEW SYLLABUS

(THIRD SEMESTER)

CENTRE FOR DISTANCE AND ONLINE EDUCATION

DIBRUGARH UNIVERSITY

(Full Marks 30 for each course.)

COURSE : BCA 301 (MATHEMATICS-III)

Assignment – 1 *Marks – 5×3=15*

(Answer any three)

1. State and prove the necessary and sufficient condition for f(z) to be analytic.
2. State and prove Cauchy's integral theorem. Is the converse true? If true prove it.
3. What is harmonic function? Prove that f (z)= u+iv is analytic functions in some region of the z-plane, then u, v are harmonic functions.
4. a. Show that the sequence $\{a_n\}$ is bounded monotonic increasing sequence given by $a_n=\frac{1}{1.2}+\frac{1}{2.3}+\frac{1}{3.4}\ldots\ldots+\frac{1}{n.(n+1)}$

   b. Show that the sequence $\{u_n\}$, where $u_n=\sqrt{n+1}-\sqrt{n}$ is a null sequence.

Assignment – 2 *Marks –5×3=15*

1. Prove that the auxiliary series $\sum\frac{1}{n^p}=\frac{1}{1^p}+\frac{1}{2^p}+\frac{1}{3^p}+\cdots+\frac{1}{n^p}+\cdots$is convergent if p>1 and divergent if p≤1.
2. Examine the convergence of a. $\int_{-\infty}^{\infty}\frac{xdx}{1+x^2}$and b. $\int_0^1\frac{dx}{x^{\frac{1}{2}}(1-x)^{\frac{1}{2}}}$
3. Examine the convergence of the series a. $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\cdots$ and b. $\sum\frac{n^{n^2}}{(n+1)^{n^2}}$
4. a. Prove that the Legendre polynomials are orthogonal on the interval [-1, 1].

COURSE : BCA 302 (THEORY OF COMPUTING)

Assignment – 1 *Marks –5×3=15*

1. Define Arden's Theorem.
2. Construct a D.FA for language
   $L=\{a^n \mid n \geq 1\}$
3. Explain Push-Down Automaton.

Assignment – 2 *Marks –5×3=15*

1. Differentiate between Context free and Context Sensitive grammar.
2. Using Pumping Lemma show that $L=\{a^p/p$ is prime$\}$ is not regular.
3. Describe NP-Hard and NP-Complete problems. Give examples.

COURSE : BCA - 303 (INTERNET AND WEB PROGRAMMING TECHNOLOGIES)

Assignment – 1 *Marks – 5×3=15*

1. What is cascading Style Sheet? Explain various types of Style sheets with examples.
2. Discuss some popular web browser.
3. What is client /server network ?

Assignment – 2 *Marks – 5×3=15*

1. Describe the features of a web browser. Explain how browser works.
2. What is ASP ? How does it work?
3. What is Javascript ? How would you write a program in Javascript ?

COURSE : BCA- 304 (COMPUTER GRAPHICS)

Assignment – 1 *Marks – 5×3=15*

1. Explain the color generation techniques in a CRT.
2. What do you understand by computer graphics ? What is the difference between raster and random scan?
3. Explain Cohen-Sutherland line clipping algorithm.

Assignment – 2 *Marks –5×3=15*

1. What are translation, Scaling and Rotation ?
2. What are the basic rules for animation ?
3. Discuss some concepts of virtual reality.

COURSE : BCA- 305 (DESIGN AND ANALYSIS OF ALGORITHMS)

Assignment – 1 *Marks – 5×3=15*

1. Explain the various asymptotic notation used in represent the time complexities.
2. Discuss Greedy method.
3. Explain Kruskal's algorithm to obtain minimum spanning tree with the help of any example.

Assignment – 2 *Marks –5×3=15*

1. Explain Travelling-Salesman problem.
2. Write the properties of a binary tree.
3. Explain NP –Completeness.

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